

DOCKET NO: 273286US0PCT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :
HIROSHI SUGITATSU, ET AL. : EXAMINER: MCNELIS, K. A.
SERIAL NO: 10/541,457 :
FILED: JULY 6, 2005 : GROUP ART UNIT: 1742
FOR: METHOD FOR REDUCING :
CHROMIUM CONTAINING RAW :
MATERIAL :

DECLARATION UNDER 37 C.F.R. § 1.132

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

I, Takao Harada, declare and state as follows:

1. I am a named co-inventor in the above-identified application.
2. I am familiar with the claims and the prosecution history in the above-identified application.
3. A rationale of the Examiner for concluding that the claims are unpatentable is her finding that **carrying out the reducing step at an average rate of raising the temperature of the mixture of 13.6°C/s [now corrected to 13.96°C/s] or higher in the period from the initiation of the radiation heating of the mixture until the mixture reaches 1114°C** in the method for reducing a chromium-containing material of the invention claimed in the above-identified application, is a result-effective variable which would have been obvious to optimize, and thus does not establish patentability of the claimed subject matter.

(Emphasis added.)

4. In support of finding that the above-emphasized limitation was a known result-effective variable, the Examiner has relied on US 5,730,775 (Meissner et al) and *Perry's Chemical Engineers' Handbook* (Perry).

5. Perry has been relied on for a finding that the rate of radiant heat transfer in a furnace is strongly affected by temperature.

6. Meissner et al has been relied on for a finding that "the temperature of the radiant heat transfer source is a result effective variable which is varied to affect the time required to achieve metallization goals."

7. The method and apparatus of Meissner et al has nothing to do with reduction of chromium-containing materials and thus cannot possibly shed any light on the problems which the present invention addresses. Thus, while it is well-known in the art to reduce chromium oxide-iron oxide mixtures in the presence of a carbonaceous material, such reductions have been problematical for various reasons, including the fact that iron oxide undergoes reduction by carbon at a lower temperature, and thus earlier than corresponding reduction of chromium oxide, thereby leaving insufficient carbonaceous material to achieve a desired chromium reduction degree. Increasing the amount of carbonaceous material to overcome this problem results in other problems. The above-emphasized limitation of the present claims is not simply rapid heating but rather raising the temperature at a particular minimum rate and for a particular period, ending at a particular end temperature, which coincides with the temperature at which the reduction of chromium oxide starts.

8. The above-emphasized limitation was not a known result-effective variable at the time the presently-claimed invention was made. US 6,152,983 (Kamijo et al) which is earlier work of the present Assignee, discloses reduction of pellets including zinc oxide and iron oxide. In Kamijo et al, the pellets are heated at a temperature elevation rate of from 3 to

13°C/sec within a temperature range of from 150 to 900°C. It is unusual to heat pellets rapidly at a temperature elevation rate of 13.96°C/sec or greater within a temperature range of from 25 to 1114°C, as required by the present invention.

9. An object of the present invention is to attain a sufficiently high Cr reduction degree. To that end, the temperature of the pellets has to be raised to at least 1114°C, which is the temperature at which the reduction of chromium oxide starts, by the time the Fe metallization degree reaches 50%.

10. The undersigned declarant declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

11. Further declarant saith not.

Takao Igarada
Signature

Aug 10, 2007
Date

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